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ABSTRACT

The oral communication skills of bilingual students in Wales were examined in a study reported in this paper. Oral facility was treated according to five indices: quantity and quality of words in the oral response, time taken to complete the response, length of pauses and number of corrections and repetitions. Pictorial frames provided a visual stimulus. Three standard tests were used to measure intelligence and English and Welsh attainment. The sample included 291 children aged 10-12, grouped according to socioeconomic class, "Welshness" of linguistic background and type of school. It appeared that middle-class children achieved higher on the standard tests than working-class children, but showed no differences in Welsh oral facility and differed in English oral facility only in the quality index. The main differences in oral facility are between linguistic-background groups, rather than socioeconomic classes. The more Welsh or English in the child's background, the lower the quality of oral responses in the other language. The language of instruction in school and the emphasis on written or oral work in teaching also affect scores. Care should be taken in selecting both the medium and the method of instruction for each child. (CHK)

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ORAL FACILITY IN BILINGUAL AND MONOGLOT CHILDREN

A. R. JONES

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FACULTY OF EDUCATION
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FOREWORD

This pamphlet constitutes an abridgement of Mr Arfon R. Jones's M.A. dissertation entitled " Oral Facility in Bilingual and Monoglot Children ", based on research which he carried out in certain districts of Wales during the years 1965-66. It is of special interest because an undue proportion of past research into bilingualism in Wales has been confined to the *written* language and has been conducted by means of *written* tests. Here is an account of results yielded by *oral* tests — some of them being of the author's own devising. It is also of importance as being the first attempt to apply Professor Basil Bernstein's concept of " elaborated " and " restricted " codes of speech to the speech of Welsh children.

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INTRODUCTION

The major investigations in the field of bilingualism in Wales have been mainly concerned with the relations between bilingualism, intelligence, and educational attainment. The investigation reported in this pamphlet has attempted to enlarge the area of enquiry. It is felt that speech engendered in a face-to-face encounter displays more of the characteristics of the 'culture' of the speakers than written matter does. If so, the position and status of the participants, and the domain of the speech encounter, are of considerable importance in any study of bilingualism. The status of a language in a bilingual nation depends, at least partly, upon the social status of the speakers. It is also related to the situations in which speech occurs.

The bilingual situation, too, imposes certain psychological conditions on the child. The psychological implications of linguistic phenomena such as pauses, hesitations, corrections, and repetitions are crucial to the understanding of the mental and speech processes of the bilingual child.

Such sociological and psychological conditions necessitate a study of language *in use*. In Wales in particular, investigations into bilingualism have tended to equate language with its written form. Investigators have rarely tried to ascertain the actual use of language (one notable exception being R. Cyril Hughes's study of the language spoken by eight-year-old Welsh speakers in North Cardiganshire (1).)

While there are obvious similarities between oral and written responses, basically they form two different types of communication. By the nature of the process the oral response is the more spontaneous, and because written communication is slower for physical reasons other variables are present in it, such as the opportunity to think and to plan the nature of the response. More important still, the written response takes place in more formal situations and is usually closely related to the educational attainments and cultural attitudes of the writer. Subtle variations involved in the 'role' of the first speaker *vis-à-vis* the second are liable to be lost in written communication. Even the partially literate can communicate by speech and, whatever his 'role' may be, is able to convey by tone and gesture, by choice of words, by emphasis and by speech patterns, a myriad of attitudes, ideas, and suggestions denied to him in an attempt at written communication.

The theoretical basis of the present work draws heavily on previous researches in monolingual situations. Lack of space entails that reference to their work, especially Bernstein's on Elaborated and Restricted Codes (2) and Goldman-Eisler's on Hesitation Pheno-

mena (3), cannot be adequately presented. An understanding of modern developments in socio-linguistics and psycho-linguistics is essential to the serious study of bilingualism and its implications for education and the process of learning.[1]

The Structure of the Investigation

1. A major problem was the *definition of Oral Facility* and, in particular, how to reduce language into units that could be codified and treated statistically. After considerable thought Oral Facility was treated in terms of the following five indices[2]:

(*a*) the Quantity index, i.e. the *total* number of words in the oral response;
(*b*) the Quality index, i.e. the number of *different* words in the oral response;
(*c*) the Time index, i.e. the time in seconds taken to complete the oral response;
(*d*) the Pause index, i.e. the total time (in seconds) of hesitations of over one second's duration;
(*e*) the Corrections and Repetitions index, i.e. the number of corrections and repetitions in the oral response.

2. The *visual stimulus* consisted of seven pictorial frames which together made up a story. The child's oral response was recorded on tape.

3. *Standardised Tests of Intelligence and Attainment (non-oral).*

(*a*) Intelligence: Raven's Progressive Matrices, 1938.
(*b*) English Attainment: Moray House English Test No. 12.
(*c*) Welsh Attainment: Prawf Cymraeg C1, Faculty of Education, Aberystwyth.

(*a*) is a non-verbal test of intelligence consisting of 60 pattern-diagrams. The child records his answers on a separate form, and

[1] Briefly, Bernstein's view is that children of the lower socio-economic classes in England hear, and therefore use, speech limited in vocabulary, syntax, and idiom, whereas children of the middle and upper classes hear and use speech wider in vocabulary, more varied in syntax, and richer in idiom. The former he terms the "restricted code", the latter the "elaborated code".

[2] For a discussion of these indices and of all other structures and techniques used in the investigation see chapters 3 and 4 of the unpublished M.A. dissertation by A. R. Jones, "Oral Facility in Bilingual and Monoglot Children" (1969) (National Library of Wales or Library of University College of Wales, Aberystwyth).

there is no time-limit, which renders the test specially suitable for bilingual and rural children. The only oral element lies in the Instructions, which are read aloud by the tester; the testers are not asked to speak at all. It is probably the most widely-used non-verbal test of intelligence in Britain.

(*b*) Except for the reading aloud of the initial Instructions by the tester, this test is also entirely non-oral. It would be, however, misleading to describe it as a 'written' test, since the testees have very little actual writing to do, most of the items being answered by *underlining* one of several alternative answers printed in the test-booklet. It is therefore described herein as 'non-oral'. It tests most aspects of attainment in non-oral English except continuous composition. There are 120 items, and a time-limit of 45 minutes.

(*c*) is similar in essentials to (*b*), but of course entirely in Welsh. There are 120 items, and a time-limit of 45 minutes.

4. The *sample of children tested* consisted of 291 children between the ages of 10 and 12 drawn from 17 schools in Wales and one school in England (Manchester).

5. *Grouping of the sample.*

The children were grouped according to (i) socio-economic class, based mainly on their fathers' occupation (5 *classes*); (ii) the degree of 'Welshness' in their linguistic background (5 *groups*); (iii) the type of school which they attended (3 *types*).

(i) was based upon (though not identical with) the socio-economic classification of W. R. Jones in "Bilingualism and Intelligence" (4), his 9 occupational classes[1] being here reduced to 5 because of the smaller numbers involved. (ii) was based upon the application of M. E. G. Price's Linguistic Background Scale (5). (iii) was based upon the medium of instruction in the 18 schools.

[1] These are:

1. Professional and large employers
2. Small employers
3. Salaried employees
4. Non-manual wage earners
5. Skilled manual wage earners
6. Semi-skilled manual wage earners
7. Unskilled manual wage earners
8. Farmers
9. Agricultural workers

6. *Statistical Techniques.*

A. The children's differences of mean scores among the

(i) 5 social *classes* (I-V). (ii) 5 linguistic *groups* (A-E), (iii) 3 school *types* (1-3),	on the	(*a*) indices of Oral Facility in Welsh and English, (*b*) Raven's Progressive Matrices, (*c*) English and Welsh (non-oral) Attainment Tests,

were tested by the Variance Ratio "*F*" and the "*t*" test of significance.

B. To determine whether the difference in distribution of social classes within the linguistic groups, and both of these within the school types, were statistically significant, the formula for the Standard Error of Difference of Percentages was used. (See Appendix A, p. 21).

ORAL FACILITY AND SOCIAL CLASS: TEST RESULTS

The 291 children were divided into 5 social (or rather socio-economic) *classes* as follows, according to their fathers' occupation:

Class	*Description*	*Number*
I	Professionals and large employers	51
II	Small employers and salaried employees	52
III	Wage-earners: non-manual, skilled & semi-skilled manual	86
IV	Wage-earners: unskilled manual	74
V	Farmers and agricultural workers	28
		291

A study of Table 1 (p. 18) shows a sharp division in attainment and intelligence amongst the social classes. If classes I and II are equated broadly with the 'middle classes' and class IV with the 'working classes', it appears that the children of the latter are lower in both English and Welsh (non-oral) attainment and in intelligence. This suggests that factors associated with social background are potent influences on a child's attainment. If this can be accepted it follows that the conclusions of W. R. Jones *et al.* require to be supplemented when they suggest that linguistic background has a decisive influence on Welsh attainment (6).

(a) Welsh Oral Facility

No significant differences were found between social classes in any index of *Welsh Oral Facility*. This is surprising, but two possible interpretations may be offered:

(i) All the social classes may be using Welsh at approximately the same level of 'elaboration' or 'restriction' (in Bernstein's sense); and this despite the middle-class child's superiority in non-oral attainment and intelligence. If so, it would suggest that socio-economic class differences do not exist in Welsh Oral Facility and that oral usage of Welsh is not socially stratified to the same extent as English is — Welsh is more indicative of a common culture.

(ii) As opposed to the above it could be suggested that the indices of oral facility employed are too crude to show up differences, or that the visual stimulus was not strong enough to allow *quality* of response to emerge (as between social classes). However, major differences on these indices *do* arise between the linguistic groups and the school types, and this suggests that these grounds of criticism may not be valid.

(b) English Oral Facility

In *English Oral Facility* only one index shows significant differences among the classes. The Quality index could be considered crucial since it provides evidence of a discriminating use of language. A high score on this index shows not only a wide vocabulary but also a good qualitative use of that vocabulary.

Table 1 shows on this index a significant dichotomy between the scores of urban children and children whose fathers are engaged in agricultural occupations, in favour of the urban children. In this it differs from *Welsh* Oral Facility, which may have been governed to a lesser extent by variations in the social environment.

ORAL FACILITY AND LINGUISTIC BACKGROUND: TEST RESULTS

The 291 children were divided into 5 linguistic *groups* as follows, according to their score in the Welsh Linguistic Background Scale:

Group	*Description*	*Range of Scores in W.L.B.S.*	*Number*
A	Monoglot English	0-2	93
B	Strongly English with some Welsh	3-15	51
C	English with strong Welsh influence	16-35	39
D	Mixed English-Welsh	36-60	55
E	Predominant Welsh with some English influence	61-91	53
			291

Lack of significant differences in the scores on the untimed non-verbal test of intelligence (Table 3, p. 20) when coupled with lack

of significant differences in distribution of social classes among linguistic groups (see Appendix A) suggests that degree of linguistic background does not play a part in influencing children's reasoning ability. Distinctions found in previous investigations between monoglot and bilingual children may be the result of differences in socio-economic status.

Scores in English (non-oral) Attainment produce some surprising results. They contradict most other findings on the influence of bilingualism on English attainment. It is Group D that gains the highest score in English (non-oral) Attainment. Common sense would suggest that the continued use of English by the monoglot child should produce better scores, the bilingual child being faced with the distraction of having another language. The linguistic background of Group D approximates to one where the languages are on an equal footing. Their superior scores might be due to richer language environment in a situation where two languages have parity of esteem and use. In such a situation neither language would predominate over the other, which happens in all the other groups. This might lead to greater awareness and appreciation of language, both of which tend to raise scores in language attainment tests.

In Welsh attainment, on the other hand, the results are straightforward. The higher the degree of Welsh Linguistic Background (and hence the greater contact time with Welsh) the higher are the scores in Welsh (non-oral) Attainment. It would seem that two factors are operating: social class and linguistic background. Because of the positive relationship between scores in Welsh (non-oral) Attainment and linguistic background it appears that, while social class may play some part, equally influential is the degree of Welsh background.

(a) Welsh Oral Facility

In Welsh Oral Facility the linguistic-background influence is paramount. A greater degree of verbal planning and selection seems to be operative among Groups D and E, since their *Quality index* scores are superior to those of Groups B and C, despite a lack of significance between the groups on the *Quantity index*.

Two different language operations are here exemplified. The groups with the higher 'English' backgrounds may be attempting a response from a language register in which they are uncertain and which is inadequate for the demands made upon it. The situation is one where the major need is to produce *any* sort of response; not a search for a particular word, but for any oral response whatever to satisfy the requirements of the situation. Groups D and E, on the other hand, with their higher 'Welsh' backgrounds, possess a language register which is varied and rich in quality; their speech

is more controlled and their major need is to discover the *right* word for the situation *among the many that are available.*

The concept of ' linguistic handicap ' is clearly illustrated in Welsh Oral Facility with scores on the *Pause index*, since an inverse relationship is established. In the use of Welsh, the more ' Welsh ' the background the smaller the score on the Pause index. Here the Pause index is not an indication of verbal planning (see Goldman-Eisler (3)) but of verbal uncertainty or insecurity; the child is not pausing in order to reach a higher quality of oral response, but because his degree of facility is low and no verbal pattern is easily available.

The planning procedure may be hindered by a confusion that may possibly arise in a bilingual situation, but any hindrance that may occur is more likely to be due to the obligation to produce an oral response in a language in which the child has not an adequate register or an adequate stock of verbal signifiers. (A ' signifier ' is a word which names an object or event (called the ' significate ') and is used to refer to the latter even when it is not present at the time of the utterance). It is suggested that Groups B and C when using Welsh have readily available the signifier *in English only*. The corresponding signifier in Welsh is either lacking or is unavailable in conversation. Correspondingly long pauses occur in order to bring out the response or to find alternative means of expression. Verbal planning may be operative on two levels: (i) the child from Group B or C may be thinking in English and translating signifiers which are readily available in English into a suitable signifier in Welsh. In this case the pause is operative either because of the translation process or because the signifier is not equally available, or both. (ii) The child may have accepted the role of Welsh and may be thinking in it; however, because of the paucity of his vocabulary (i.e. the inadequate amount of signifiers available), he cannot either represent the significates or place them in a meaningful Welsh context.

Vygotsky (7) assumes that in a monolingual situation the " ability to think, reason, remember, plan, and organise has its basis in meaningful language. If children are inadequately trained in word meaning, they will likely be retarded." The *bilingual* situation, however, makes a vital difference. Here the child's perceptual and mental development occurs mainly in one language, but he also has the use of the other language though in terms of perceptual and linguistic response it may not be an adequate vehicle for the development of intellectual concepts. A problem for the teacher may arise when the child, although appearing to be reasonably bilingual and with an ability to produce an oral response in the two languages, is at a disadvantage if he is taught through the medium of the language in which he is weaker. One indication of this would be a high *Pause index*. The appropriate action to take in the case of such a child would be re-education in word meaning in his weaker language.

In teaching the more abstract concepts, the medium may be of crucial importance. The use of two signifiers, one Welsh and one English, relating to a single abstract object (or indeed a concrete one) may not help the mental development of the child unless he is already confident about what role each languags plays in his life. Thus if Welsh is his dominant language, his attainment in arithmetic may be depressed if he is taught through the medium of English (and *vice versa*), though on the surface he is bilingual and able to produce a meaningful oral response in English. There is some evidence that this depression may not be permanent[1] but even if it were, from a general educational viewpoint this may be considered a small price to pay for increasing facility in the language used.

(b) English Oral Facility

In *English Oral Facility* two indices only prove to be significant. An inspection of Table 2 (p. 19) shows that the most 'Welsh' group paused more than Groups A, B, and C. The *Pause index* shows that English is an inadequate medium of communication of perceptual ideas for children in Group E.

The English *Corrections and Repetitions index* shows high scores for Groups D and E. It could be argued that these scores are indicative of care in speech: that the child from the predominantly English background either does not recognise his errors or is content to ignore them. However, the more likely explanation is that a high Corrections and Repetitions index assesses a greater uncertainty in the use of the language and is a sympton of anxiety and stress leading to a misuse of the language.

It should also be emphasised that the Corrections and Repetitions index was included in Mahl's (9) definition of speech disturbances and these correlated positively with the clinically related anxiety. This index predominates in the speech sample of the child from a strong 'Welsh' background, and this suggests that not only is the child finding difficulty in producing an adequate oral response but is also under stress. The child from the 'English' background does not correct or repeat himself because there is no need to do so; his speech is already "correct".

Yet it should be noted that Group D, which gained the highest score on this index, also gained the highest score in English (non-

[1] Evidence may be found in (8), pp. 53-55, Tables IX-XI, where a *mean difference* in standard scores in mathematical subjects at age 7+ between Welsh-speaking and English-speaking children of *3.15* drops at age 10+ to *2.39* and at age 14+ to *1.16* (vanishing completely in mechanical arithmetic). See also p. 120.

oral) Attainment. It would thus appear that academic ability and confidence in the written forms of language are not necessarily positively correlated with fluency in Oral Facility. Group D's high scores on the Corrections and Repetitions index illustrate the need for practice and application in Oral Facility.

ORAL FACILITY AND SCHOOLS: TEST RESULTS

The schools attended by the 291 children were divided into 3 *types* based on the medium of instruction:

Type	*Description*	*Number of* Schools	Children
1	English-medium, with either *no* Welsh taught or a maximum of 30 minutes per day	7	120
2	Medium mainly English but at least 5 subjects taught through Welsh	5	90
3	Welsh medium dominant ("Ysgolion Cymraeg")	6	81
		18	291

In the preceding pages the statistically significant influence of *socio-economic class* (or, at least, fathers' occupation) and *linguistic background* on the scores of children in Oral Facility, non-oral Attainment (in Welsh and in English), and Intelligence (non-verbal) has been described. It was considered highly desirable to investigate also whether the distributions of social *classes* and of linguistic background *groups* within the school *types* were significantly different. Appendices B and C give these results in detail. It is interesting to note that the Welsh-medium schools (type 3) appear to attract a larger proportion of children whose parents are in the higher social classes, with a correspondingly smaller proportion of children from a working-class environment. This relationship may go some way towards providing an explanation for the higher scores of the Welsh-medium pupils in Intelligence and non-oral Attainment, (Table 3, p. 20).

However, the influence of social class cannot be postulated as a full explanation for the significant differences in scores in favour of Type 1 schools as compared with those of Type 2, since there is no significant difference in the distribution of any of the social classes in these schools. We have already seen that linguistic background appears to exert no influence on non-verbal intelligence test scores, and therefore a possible explanation may lie in the medium of instruction. In most subjects taught in schools there will be elements of abstraction. In schools of Type 2, where subjects may be taught in either Welsh or English, the child may find difficulty in developing a relationship between concepts taught through the medium of the one language and those taught through the medium of the other. In

other words, the child may have difficulty in reasoning abstractly because neither of the mdia, within the confines of the school, provides a sufficiently stable and solid framework for reference and for the development of conceptual thought.

Similarly, the possible detrimental influence of " dual " language instruction on non-verbal intelligence test scores may be due to the child being taught some subjects in his " weaker " language or in a mixture of the two languages, though the child may *appear* to be reasonably competent in both.

Thus, one may suggest that schools where one language is entirely dominant in the early stages of education are less likely to affect adversely the conceptual development of children than schools where two languages are utilised.

These findings are of course applicable to the school situation only.

(a) English and Welsh non-oral Attainment

In English and Welsh non-oral Attainment the Welsh-medium schools (Type 3) again show superior scores over the other types. Instruction in Welsh appears to have no adverse effect on English non-oral Attainment, but the social background may be providing the pupils with above-average motivation due to encouragement by the parents and their expressed concern for their children's educational progress.

(b) Welsh Oral Facility

In Welsh Oral Facility the higher mean score on the Quality index, coupled with the higher mean scores on this index by Groups D and E, suggests that some children have a relatively extensive range of alternative words. Where this is so the pattern of organising elements becomes less sterotyped. In Bernstein's " restricted code " (2) one characteristic is the severe limitation of alternatives available to the working-class child. When the Welsh Quantity index is also taken into consideration there is the possibility that *both* " codes " are being utilised.

However, the language analysis of the present research is essentially of the 'lexical' type, i.e. an examination of the *number* of *different* words used. An analysis in terms of restricted and elaborated codes applied to the Welsh bilingual situation needs basically a syntactic analysis. Further research on these lines could lead to fruitful results.[5]

[5] This is now being attempted by Mr W. L. Griffiths under the aegis of U.C.W. Faculty of Education.

Table 3 (p. 20) shows that Type 3 schools are also superior on the Welsh *Pause index* and the Welsh *Corrections and Repetitions index*. They are thus the best in all aspects of Welsh Oral Facility here tested, except in Quantity (in which, unexpectedly, Type 2 is better, though not "significantly"); but their superiority is not so marked as in Welsh (non-oral) Attainment, where they have a tremendous lead over Type 2 — much greater, naturally enough, than they have in English (non-oral) Attainment.

What is the source of this superiority in Welsh Oral Facility of Type 3 schools? Similar differences were found when the data were grouped according to linguistic background; and though the statistical data in Appendix P (p. 21) show that Types 2 and 3 are not significantly different in the distribution of linguistic groups, one cannot altogether discount the influence of factors associated with linguistic background. It would be facile to ascribe these differences *solely* to the difference in medium of instruction. Other factors may be involved, such as the size of classes, the amount of *oral* teaching and response, the nature of the school, and, especially, the dedication and quality of the teachers. However, without doubt *one* major factor must be the fact that the medium of instruction in Type 3 schools is predominantly Welsh.

Another factor of considerable importance is the *attitude* of the pupils to the Welsh language. W. R. Jones (10), in dealing with a second-language situation, found that favourable attitudes towards Welsh tended to decline in succeeding years. One of the major advantages of the Welsh-medium schools may be that the status given to Welsh as the major language reinforces favourable attitudes. In Type 2 schools, the equal status given to Welsh may not be strong enough to counteract the anglicising effect of a mainly English environment — in particular, that of the 'mass media'.

(c) English Oral Facility

In English Oral Facility the results indicate a marked difference in the use of English between the monoglot English schools of Type 1 on the one hand and those where Welsh is the main medium of instruction (Type 3) or has parity with English (Type 2) on the other. On the *Pause index* the three types gained respectively mean scores of 5.70, 9.30, and 7.94. The interesting point here is that the pupils of Type 2, despite having the highest mean Pause score, nevertheless took a shorter time to complete their oral response than those in Type 3. One explanation may be that insecurity in English, and possible confusion arising from being taught in two languages, handi-

cap the pupils in Oral Facility, thus motivating them to complete their oral response too quickly, so as to let them escape sooner from the situation imposed upon them by the investigator. Pupils of Type 3, though showing more Pauses than those in Type 1, nevertheless as compared with those of Type 2 are more able to tolerate the situation.

The superiority of Type 3 schools in English Attainment (non-oral) is not transferred to Oral Facility, for its pupils are at a disadvantage compared with those of Type 1, whose school instruction is entirely in English. This finding should, however, not be used to suggest that Welsh-medium schools necessarily handicap the bilingual child, for the effect of linguistic background on the English Pause index suggests that other factors besides teaching through the medium of Welsh have contributed to this result. Nor should it be thought that more teaching through English would ameliorate the situation, since the pupils of schools where Welsh and English have parity seem to have even greater language uncertainty.

However, when we look at the *Corrections and Repetitions index* there appears to be a progressive deterioration in the quality of the oral response as instruction through Welsh becomes dominant in the school situation. One hesitates to suggest that a causal relationship exists between the amount of Welsh used and the quality of English oral response. Nevertheless, when the two indices are taken in conjunction it does appear that the medium of instruction in schools of Types 2 and 3 acts to some extent as a hindrance to Oral Facility in English:

Type of School:	1	2	3
Mean Score in Corrections & Repetitions index (English)	3.65	4.65	5.21

However, another factor in the situation may be not so much the medium of instruction as the *kind of teaching* in the Welsh-medium schools. The superiority in English (non-oral) Attainment of children in Type 3 schools is influenced by social class; it may also be related to a probable emphasis on *written* work in English as opposed to concentration on *oral* work. No evidence has been obtained in this investigation to show the proportions of oral and written work done in the schools. Nevertheless, most of the children in our sample had been taught with the 11+ examination in mind. Because of the nature of this examination it would be reasonable to suppose that a greater concentration on written work in English and on the elements which make up an Attainment Test was a major part of classroom activity. It may well be that if equal emphasis had been placed on practice in oral expression the scores in Oral Facility would have been higher, since the pupils would have had greater confidence in the use of spoken English.

CONCLUSION

It appears that in Wales children do better in (non-oral) tests of intelligence and attainment the higher their socio-economic class (as measured by father's occupation). On the other hand, **oral facility** in Welsh, as measured by indices of Quantity, Quality, Time taken, duration of Pauses, and number of Corrections and Repetitions, exhibits little difference from one socio-economic class to another; this is not wholly consistent with some of Bernstein's findings in England, and may be indicative of greater social cohesion in Wales.

The major differences in oral facility in Wales are not between socio-economic classes but between *linguistic-background groups* classified by the results of a questionnaire. The more Welsh in the child's background, the lower, in general, is the Quality of his oral response in English; similarly, the more English there is in his background, the lower, in general, is the Quality of his oral response in Welsh.

The medium of instruction in schools (and possibly the method of teaching: emphasis on *written* or on *oral* work) also appear to affect the children's scores. Pupils of Welsh-medium schools do better in oral Welsh than pupils of schools where Welsh and English are used about equally, but they do less well in oral English than pupils of purely English-medium schools. Thus it seems that teachers would do well to take great care in deciding on the most suitable *medium* and *method* of instruction for each individual child. Apparent facility in a language does not necessarily mean that that language is the most suitable medium through which to promote the child's intellectual development.

TABLES 1, 2, & 3.

Readers unfamiliar with modern statistical methods are advised to peruse the following paragraphs before turning to the Tables.

When the Analysis of Variance (second column of each Table) is "statistically significant" (denoted by S. in the column), it is legitimate to proceed to compare *each pair* of Class, Group, or Type Means by the "*t*" test, which yields the *probability* (expressed here as a percentage) that differences of mean scores as large as those found would not occur by mere chance. It is conventionally agreed amongst statisticians that when this probability reaches 95% the difference may be accepted as "significant" (S.); and that when it reaches 99% the difference may be regarded as "highly significant" (H.S.). However, it is felt that these limits are somewhat arbitrary; and accordingly in what follows the convention has been extended: probabilities above 99.9% are designated "Very Highly Significant" (V.H.S.), and those between 90% and 95% are described as "Almost Significant" (A.S.).

These probabilities indicate the *degree of confidence* we may place in concluding that one Class, Group, or Type has made higher mean scores than another. (Statistical methods can never attain to *certainty*.)

When, on the other hand, the Analysis of Variance *fails* to reach statistical significance, it is invalid to apply the "*t*" test at all. This is indicated in the Tables by the entry **N.S.** (Not Significant) in the second column. In these cases we can have but little confidence that the differences are not due to mere chance.

See D. G. Lewis, "Statistical Methods in Education" (U.L.P. 1967) (11).

TABLE 1. SOCIO-ECONOMIC CLASSES (FATHER'S OCCUPATION)

I: Professionals & large employers.
II: Small employers & salaried employees.
III: Wage-earners: non-manual, skilled & semi-skilled manual.
IV: Wage-earners: unskilled manual.
V: Farmers & agricultural workers.

	DIFFERENCES BETWEEN CLASSES		
Test or Index	Analysis of Variance	Classes compared (with mean scores)	"*t*" test: Probability that differences are NOT due to mere chance
Intelligence (non-verbal)	H.S.	I (43.65) & IV (37.31) II (41.96) & IV	Over 99.9% Between 98 & 99%
English Attainment	V.H.S.	I (71.57) & II (50.60) I & III (52.38) I & IV (44.45) I & V (40.32) III & IV III & V	Over 99.9% Do. Do. Do. Between 95 & 98% Between 98 & 99%
Welsh Attainment	V.H.S.	I (73.40) & II (53.70) I & III (46.09) I & IV (38.02) I & V (40.33) II & III II & IV II & V III & IV	Over 99.9% Do. Do. Do. Between 95 & 98% Over 99.9% Between 99 & 99.9% Between 98 & 99%
English Quantity	N.S.		
English Quality	S.	I (141.7) & V (119.5) II (149.0) & V III (146.0) & V IV (140.9) & V	Between 99 & 99.9% Do. Over 99.9% Between 95 & 98%
English Time	N.S.		
English Pause	N.S.		
English Corrections & Repetitions	N.S.		
Welsh Quantity	N.S.		
Welsh Quality	N.S.		
Welsh Time	N.S.		
Welsh Pause	N.S.		
Welsh Corrections & Repetitions	N.S.		

N.B.—In each comparison the better Class is placed first. For values of "*F*", "*t*", and for computations, see unpublished dissertation.
In col. 2, S. means "Significant"; H.S. "Highly Significant"; V.H.S. "Very Highly "Significant"; and N.S. "Not Significant".

TABLE 2. LINGUISTIC-BACKGROUND GROUPS

A: Monoglot English.
B: Strongly English with some Welsh.
C: English with strong Welsh influence.
D: Mixed English and Welsh.
E: Predominantly Welsh with some English influence.

	DIFFERENCES BETWEEN GROUPS		
Test or Index	Analysis of Variance	Groups compared (with mean scores)	"*t*" test: Probability that differences are NOT due to mere chance
Intelligence (non-verbal)	N.S.		
English Attainment	S.	D (60.15) & A (48.25)	Between 99 & 99.9%
		D & B (49.51)	Between 95 & 98%
Welsh Attainment	V.H.S.	C (44.67) & B (25.83)	Between 99 & 99.9%
		D (59.76) & B	Over 99.9%
		E (61.25) & B	Between 95 & 98%
		D & C	Between 99 & 99.9%
		E & C	Over 99.9%
English Quantity	N.S.		
English Quality	N.S.		
English Time	N.S.		
English Pause	H.S.	A (6.07) & E (11.23)	Over 99.9%
		B (5.63) & E	Do.
		C (6.66) & E	Between 99 & 99.9%
English Corrections & Repetitions	S.	A (3.74) & D (5.76)	Over 99.9%
		A & E (5.37)	Do.
		B (3.98) & D	Do.
		B & E	Do.
		C (4.00) & D	Do.
		D & E	Do.
Welsh Quantity	N.S.		
Welsh Quality	H.S.	D (54.27) & B (44.87)	Between 98 & 99%
		E (56.90) & B	Between 99 & 99.9%
Welsh Time	N.S.		
Welsh Pause	H.S.	D (13.25) & B (21.79)	Do.
		E (12.37) & B	Do.
		E & C (17.92)	Between 95 & 98%
Welsh Corrections & Repetitions	N.S.		

N.B.—In each comparison the better Group is placed first. For values of "*F*", "*t*", *and* for computations, see unpublished dissertation.
In col. 2, S. means "Significant"; H.S. "Highly Significant"; V.H.S. "Very Highly Significant"; and N.S. "Not Significant".

TABLE 3. TYPES OF SCHOOL

1: English-medium, with either *no* Welsh taught or a maximum of 30' per day.
2: Medium mainly English but at least 5 subjects taught through Welsh.
3: Welsh medium dominant.

	DIFFERENCES BETWEEN TYPES		
Test or Index	Analysis of Variance	Types compared (with mean scores)	"*t*" test: Probability that differences are NOT due to mere chance
Intelligence (non-verbal)	H.S.	1 (40.84) & 2 (37.62) 3 (42.42) & 2	Between 95 & 98% Between 99 & 99.9%
English Attainment	H.S.	3 (60.02) & 1 (49.93) 3 & 2 (48.34)	Do. Do.
Welsh Attainment	V.H.S.	3 (63.62) & 2 (41.36)	(*F*-test, 99.9%)
English Quantity	N.S.		
English Quality	N.S.		
English Time	A.S.	1 (54.00) & 3 (61.86)	Between 95 & 98%
English Pause	H.S.	1 (5.70) & 2 (9.30) 1 & 3 (7.94)	Between 99 & 99.9% Between 95 & 98%
English Corrections & Repetitions	S.	1 (3.65) & 2 (4.65) 1 & 3 (5.21)	Do. Between 98 & 99%
Welsh Quantity	N.S.		
Welsh Quality	A.S.	3 (55.0) & 1 (51.0)	(*F*-test, 90%)
Welsh Time	N.S.		
Welsh Pause	V.H.S.	3 (11.89) & 2 (18.33)	(*F*-test, 99.9%)
Welsh Corrections & Repetitions	A.S.	3 (5.90) & 2 (7.58)	(*F*-test, 90%)

N.B.—In each comparison the better Type of school is placed first. For values of "*F*", "*t*", and for computations, see unpublished dissertation.
In col. 2, S. means "Significant"; H.S. "Highly Significant"; V.H.S. "Very Highly Significant"; N.S. "Not Significant"; and A.S. "Almost Significant".

APPENDIX A

Differences in Distribution of Socio-economic Classes within Linguistic Groups

These differences were tested by the formula for Standard Error of Difference of Percentages, $\sqrt{\frac{p_1q_1}{n_1} + \frac{p_2q_2}{n_2}}$. None of the differences was at least twice its Standard Error, i.e. none was statistically significant.

APPENDIX B

Differences in Distribution of Linguistic Groups within Types of School

With the same formula as above, the difference of percentage of Group A of the Linguistic Background Scale as between School Types 1 and 2 was at least thrice its Standard Error and was thus highly significant; the probability of this NOT being due to mere chance is over 99.7%.

The difference of percentage of Group B as between School Types 1 and 2 was at least twice its Standard Error and was thus significant; the probability of this NOT being due to mere chance is over 95%.

The difference of percentage of Group B as between School Types 1 and 3 was at least thrice its Standard Error and was thus highly significant; the probability of this NOT being due to mere chance is over 99.7%.

No other significant differences occurred between any two of the School Types.

APPENDIX C

Differences in Distribution of Socio-economic Classes within Types of School

Similarly, the difference of percentage of Social Class I as between Types 1 and 3 was significant; and as between Types 2 and 3, it failed by only a narrow margin to reach the conventional criterion of " significance ".

The difference of percentage of Social Class IV as between School Types 2 and 3 also just fell short of reaching " significance ".

No other significant differences occurred between any two of the School Types.

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